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City Growth and the 2000 Census: Which Places Grew, and Why

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"A variety of attributes that a city might have had in 1990 can explain whether it grew or shrunk over the decade."

Findings

A survey of 2000 census data reveals that, among U.S. cities with 1990 populations greater than 100,000:

- **The median growth rate for cities in the 1990s was 8.7 percent—more than double the median growth rate of the 1980s.** However, there is an extremely strong correspondence between an individual city's growth rate in the 1980s and its growth in the 1990s.
- **Western cities grew the fastest, with an average growth rate of 19 percent.** Northeastern cities, on average, declined. Southern cities grew substantially, but at about half the rate of Western cities, while Midwestern cities grew at 3 percent on average.
- **"High human capital" cities grew.** The level of residents' education and income are consistent predictors of urban growth.
- **Cities with large manufacturing bases grew much more slowly than cities with strong service industries.** Also, cities with high unemployment rates grew more slowly than those with low unemployment rates.
- **Cities built for pedestrians and mass transit shrunk (with a few exceptions), while auto-dependent cities grew.** Similarly, older cities declined and younger cities grew.
- **Foreign-born residents contributed to strong city growth rates.** Cities with more foreign-born residents in 1990 grew more quickly than other cities, up to a point.

I. Introduction

Urban growth rates in the 1990s reveal the heterogeneity of American cities. The nation is filled with cities that grew by 20 percent or more over the decade, but also with cities experiencing serious population declines. But population growth and decline is not random. There are clear patterns that describe which cities grew and which ones did not. A variety of attributes that a particular city might have had in 1990 can explain whether it grew or shrunk over the decade. Some of these attributes are susceptible to policy fixes, while others are not. This paper documents and explains the patterns of population growth and decline among American cities that had populations of more than 100,000 in 1990.[1]

II. Findings

Tables 1 through 4 show the basic data set. We included in each of these tables: (1) population in 2000, (2) population in 1990, (3) the growth rate between 1990 and 2000, (4) a measure called the Brookings City Growth Model, which predicts the growth rate for a particular city using the factors described later in this paper,[2] and finally (5) the growth rate between 1980 and 1990 (for comparison). The tables are ordered by the rate of growth in the 1990s: Table 1 lists the 87 "high fliers" (those cities with a growth rate greater than 10 percent), Table 2 lists the 55 modest growers (cities with growth rates between 2 percent and 10 percent), Table 3 includes the 20 unchanged cities (those with growth between—2 and 2 percent) and Table 4 shows the 33 declining cities (those which shrank by more than 2 percent).

Table 1: High Fliers—Cities that Grew by More Than 10%

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
Las Vegas, NV	258,295	478,434	85.2%	33.1%	56.9%
Plano, TX	128,713	222,030	72.5%	30.7%	78.0%
Scottsdale, AZ	130,069	202,705	55.9%	38.1%	46.8%
Boise City, ID	125,738	185,787	47.8%	22.0%	23.0%
Glendale, AZ	148,134	218,812	47.7%	33.7%	52.5%
Laredo, TX	122,899	176,576	43.7%	22.2%	34.4%
Bakersfield, CA	174,820	247,057	41.3%	30.0%	65.5%
Austin, TX	465,622	656,562	41.0%	20.8%	34.6%
Salinas, CA	108,777	151,060	38.9%	11.3%	35.2%
Mesa, AZ	288,091	396,375	37.6%	31.2%	89.0%
Durham, NC	136,611	187,035	36.9%	10.3%	35.1%
Charlotte, NC	395,934	540,828	36.6%	13.1%	25.5%
Santa Clarita, CA	110,642	151,088	36.6%	25.6%	N/A
Reno, NV	133,850	180,480	34.9%	17.3%	32.9%
Phoenix, AZ	983,403	1,321,045	34.4%	32.4%	24.5%
Overland Park, KS	111,790	149,080	33.4%	23.2%	36.7%
Raleigh, NC	207,951	276,093	32.8%	15.4%	38.4%
Chesapeake, VA	151,976	199,184	31.1%	12.6%	32.8%
Santa Rosa, CA	113,313	147,595	30.3%	10.3%	37.1%
Irvine, CA	110,330	143,072	29.7%	28.9%	77.6%
Winston-Salem, NC	143,485	185,776	29.5%	8.1%	8.8%
Chula Vista, CA	135,163	173,556	28.4%	14.3%	61.1%
Colorado Springs, CO	281,140	360,890	28.4%	16.0%	30.7%
Arlington, TX	261,721	332,969	27.2%	23.0%	63.5%
Salem, OR	107,786	136,924	27.1%	3.8%	21.0%
Rancho Cucamonga, CA	101,409	127,743	26.0%	27.1%	83.6%
Hayward, CA	111,498	140,030	25.6%	12.6%	19.1%

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Table 1: High Fliers—Cities that Grew by More Than 10% (continued)

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
Oceanside, CA	128,398	161,029	25.4%	13.6%	67.4%
Aurora, CO	222,103	276,393	24.4%	19.9%	40.1%
Irving, TX	155,037	191,615	23.6%	20.9%	41.0%
Anaheim, CA	266,406	328,014	23.1%	17.7%	21.4%
Sioux Falls, SD	100,814	123,975	23.0%	18.0%	23.9%
Escondido, CA	108,635	133,559	22.9%	14.8%	68.8%
Mesquite, TX	101,484	124,523	22.7%	23.1%	51.4%
Eugene, OR	112,669	137,893	22.4%	4.2%	6.6%
San Antonio, TX	935,933	1,144,646	22.3%	18.3%	19.1%
Greensboro, NC	183,521	223,891	22.0%	10.3%	17.9%
Portland, OR	437,319	529,121	21.0%	2.5%	18.8%
Fresno, CA	354,202	427,652	20.7%	22.4%	62.9%
Tallahassee, FL	124,773	150,624	20.7%	13.7%	53.0%
Hialeah, FL	188,004	226,419	20.4%	2.5%	29.4%
Tucson, AZ	405,390	486,699	20.1%	25.7%	22.7%
Moreno Valley, CA	118,779	142,381	19.9%	24.5%	N/A
Houston, TX	1,630,553	1,953,631	19.8%	12.0%	2.2%
Oxnard, CA	142,216	170,358	19.8%	14.9%	31.4%
Fort Worth, TX	447,619	534,694	19.5%	16.6%	16.2%
Garland, TX	180,650	215,768	19.4%	22.5%	30.1%
Fort Wayne, IN	173,072	205,727	18.9%	6.7%	0.4%
Pasadena, TX	119,363	141,674	18.7%	10.2%	6.0%
Ontario, CA	133,179	158,007	18.6%	16.4%	49.9%
Denver, CO	467,610	554,636	18.6%	14.9%	-5.1%
Dallas, TX	1,006,877	1,188,580	18.1%	18.0%	11.3%
Lincoln, NE	191,972	225,581	17.5%	19.0%	11.7%
Fremont, CA	173,339	203,413	17.4%	18.3%	31.4%
Nashville-Davidson, TN	488,374	569,891	16.7%	11.2%	7.2%
Albuquerque, NM	384,736	448,607	16.6%	26.1%	15.6%
Orange, CA	110,658	128,821	16.4%	23.0%	21.0%
Omaha, NE	335,795	390,007	16.1%	14.8%	7.0%
Jacksonville, FL	635,230	735,617	15.8%	11.3%	17.4%
Lexington-Fayette, KY	225,366	260,512	15.6%	11.1%	10.4%
Stockton, CA	210,943	243,771	15.6%	16.4%	42.3%
Garden Grove, CA	143,050	165,196	15.5%	18.6%	16.0%
Alexandria, VA	111,183	128,283	15.4%	17.1%	7.7%
Santa Ana, CA	293,742	337,977	15.1%	12.4%	44.0%
Anchorage, AK	226,338	260,283	15.0%	12.3%	29.7%
Modesto, CA	164,730	188,856	14.7%	20.6%	54.0%
Hollywood, FL	121,697	139,357	14.5%	5.0%	0.3%
San Jose, CA	782,248	894,943	14.4%	16.0%	24.3%
Lakewood, CO	126,481	144,126	14.0%	22.5%	11.1%
Oklahoma City, OK	444,719	506,132	13.8%	17.1%	10.1%
Salt Lake City, UT	159,936	181,743	13.6%	17.7%	-1.9%
Pomona, CA	131,723	149,473	13.5%	14.2%	42.0%
Wichita, KS	304,011	344,284	13.3%	14.2%	8.6%
San Bernardino, CA	164,164	185,401	12.9%	18.5%	38.2%
Orlando, FL	164,693	185,951	12.9%	10.5%	28.4%

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Table 1: High Fliers—Cities that Grew by More Than 10% (continued)

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
Riverside, CA	226,505	255,166	12.7%	23.0%	32.8%
Columbus, OH	632,910	711,470	12.4%	8.2%	12.0%
Sunnyvale, CA	117,229	131,760	12.4%	12.5%	10.0%
Thousand Oaks, CA	104,352	117,005	12.1%	23.4%	35.4%
Tempe, AZ	141,865	158,625	11.8%	35.1%	32.7%
Simi Valley, CA	100,217	111,351	11.1%	21.0%	29.3%
Cedar Rapids, IA	108,751	120,758	11.0%	12.1%	-1.4%
Spokane, WA	177,196	195,629	10.4%	10.9%	3.4%
Fullerton, CA	114,144	126,003	10.4%	20.6%	11.6%
Sacramento, CA	369,365	407,018	10.2%	17.1%	34.0%
San Diego, CA	1,110,549	1,223,400	10.2%	19.2%	26.8%
Amarillo, TX	157,615	173,627	10.2%	19.7%	5.6%

See note 2 for additional explanation.

Table 2: Modest Growers—Cities that Grew Between 2 and 10%

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
Waco, TX	103,590	113,726	9.8%	18.1%	2.3%
Elizabeth, NJ	110,002	120,568	9.6%	-3.0%	3.6%
Tacoma, WA	176,664	193,556	9.6%	1.0%	11.5%
Hampton, VA	133,793	146,437	9.5%	10.2%	9.1%
El Paso, TX	515,342	563,662	9.4%	23.9%	21.2%
Concord, CA	111,348	121,780	9.4%	24.3%	7.3%
New York, NY	7,322,564	8,008,278	9.4%	-8.5%	3.6%
El Monte, CA	106,209	115,965	9.2%	8.3%	33.6%
Seattle, WA	516,259	563,374	9.1%	3.3%	4.5%
Madison, WI	191,262	208,054	8.8%	13.3%	12.1%
Abilene, TX	106,654	115,930	8.7%	23.8%	8.5%
Tampa, FL	280,015	303,447	8.4%	10.3%	3.1%
Stamford, CT	108,056	117,083	8.4%	6.7%	5.5%
Glendale, CA	180,038	194,973	8.3%	18.6%	29.5%
Indianapolis, IN	731,327	791,926	8.3%	9.1%	4.4%
Virginia Beach, VA	393,069	425,257	8.2%	18.3%	49.9%
Providence, RI	160,728	173,618	8.0%	-4.2%	2.5%
Springfield, MO	140,494	151,580	7.9%	10.4%	5.5%
Corpus Christi, TX	257,453	277,454	7.8%	19.5%	10.9%
Montgomery, AL	187,106	201,568	7.7%	11.7%	5.2%
Rockford, IL	139,426	150,115	7.7%	1.4%	-0.2%
Long Beach, CA	429,433	461,522	7.5%	13.1%	18.8%
Oakland, CA	372,242	399,484	7.3%	1.4%	9.7%

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Table 2: Modest Growers—Cities that Grew Between 2 and 10% (continued)

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
San Francisco, CA	723,959	776,733	7.3%	-0.8%	6.6%
Lubbock, TX	186,206	199,564	7.2%	24.1%	6.8%
Tulsa, OK	367,302	393,049	7.0%	16.2%	1.8%
Vallejo, CA	109,199	116,760	6.9%	9.2%	36.0%
Memphis, TN	610,337	650,100	6.5%	7.2%	-5.6%
Los Angeles, CA	3,485,398	3,694,820	6.0%	13.7%	17.4%
Newport News, VA	170,045	180,150	5.9%	7.7%	17.4%
Springfield, IL	105,227	111,454	5.9%	13.7%	5.2%
Paterson, NJ	140,891	149,222	5.9%	-8.5%	2.1%
Atlanta, GA	394,017	416,474	5.7%	4.2%	-7.3%
Sterling Heights, MI	117,810	124,471	5.7%	11.3%	8.1%
St. Paul, MN	272,235	287,151	5.5%	6.6%	0.7%
Knoxville, TN	165,121	173,890	5.3%	6.9%	-5.7%
Jersey City, NJ	228,537	240,055	5.1%	-6.8%	2.2%
Grand Rapids, MI	189,126	197,800	4.6%	3.1%	4.0%
Huntington Beach, CA	181,519	189,594	4.5%	20.1%	6.5%
Columbus, GA	178,681	186,291	4.3%	9.0%	5.5%
Yonkers, NY	188,082	196,086	4.3%	0.2%	-3.7%
Little Rock, AR	175,795	183,133	4.2%	12.4%	10.5%
Ann Arbor, MI	109,592	114,024	4.0%	19.1%	1.5%
Chicago, IL	2,783,726	2,896,016	4.0%	-2.5%	-7.4%
St. Petersburg, FL	238,629	248,232	4.0%	8.8%	-0.0%
Minneapolis, MN	368,383	382,618	3.9%	6.6%	-0.7%
Baton Rouge, LA	219,531	227,818	3.8%	9.7%	-0.4%
Torrance, CA	133,107	137,946	3.6%	17.7%	2.5%
Des Moines, IA	193,187	198,682	2.8%	12.3%	1.1%
Inglewood, CA	109,602	112,580	2.7%	9.1%	16.4%
Boston, MA	574,283	589,141	2.6%	-1.7%	2.0%
South Bend, IN	105,511	107,789	2.2%	1.4%	-3.8%
Topeka, KS	119,883	122,377	2.1%	14.6%	1.0%
Chattanooga, TN	152,466	155,554	2.0%	4.2%	-10.1%
Fort Lauderdale, FL	149,377	152,397	2.0%	6.7%	-2.6%

See note 2 for additional explanation.

Table 3: Unchanged Cities—Cities that Lost or Gained No More Than 2%

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
Pasadena, CA	131,591	133,936	1.8%	18.0%	11.5%
Honolulu CDP, HI	365,272	371,657	1.8%	18.0%	0.1%
Worcester, MA	169,759	172,648	1.7%	-3.8%	4.9%
Lowell, MA	103,439	105,167	1.7%	-3.9%	11.9%
Kansas City, MO	435,146	441,545	1.5%	11.0%	-2.9%
Allentown, PA	105,090	106,632	1.5%	-1.7%	1.3%
Mobile, AL	196,278	198,915	1.3%	6.0%	-2.1%
Miami, FL	358,548	362,470	1.1%	-1.0%	3.4%
Independence, MO	112,301	113,288	0.9%	11.6%	0.5%
Shreveport, LA	198,525	200,145	0.8%	11.2%	-4.1%
Berkeley, CA	102,724	102,743	0.0%	9.8%	-0.6%
Gary, IN	116,646	116,646	0.0%	-2.2%	-23.2%
Livonia, MI	100,850	100,545	-0.3%	16.4%	-3.8%
Beaumont, TX	114,323	113,866	-0.4%	7.7%	-3.2%
Peoria, IL	113,504	112,936	-0.5%	8.1%	-8.6%
Newark, NJ	275,221	273,546	-0.6%	-9.2%	-16.4%
Huntsville, AL	159,789	158,216	-1.0%	11.9%	12.1%
Bridgeport, CT	141,686	139,529	-1.5%	-4.9%	-0.6%
Waterbury, CT	108,961	107,271	-1.6%	-4.4%	5.5%
Kansas City, KS	149,767	146,866	-2.0%	7.3%	-7.1%

See note 2 for additional explanation.

Table 4: Declining Cities—Cities that Lost More Than 2%

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
New Orleans, LA	496,938	484,674	-2.5%	1.1%	-10.9%
Richmond, VA	203,056	197,790	-2.6%	4.5%	-7.4%
Akron, OH	223,019	217,074	-2.7%	2.7%	-6.0%
Springfield, MA	156,983	152,082	-3.1%	-0.8%	3.1%
Portsmouth, VA	103,907	100,565	-3.2%	3.1%	-0.6%
Evansville, IN	126,272	121,582	-3.7%	5.6%	-3.2%
Philadelphia, PA	1,585,577	1,517,550	-4.3%	-3.9%	-6.1%
Savannah, GA	137,560	131,510	-4.4%	7.6%	-2.9%
Warren, MI	144,864	138,247	-4.6%	7.5%	-10.1%
Erie, PA	108,718	103,717	-4.6%	-5.8%	-8.7%
Louisville, KY	269,063	256,231	-4.8%	2.5%	-9.9%
Milwaukee, WI	628,088	596,974	-5.0%	-0.2%	-1.3%
Rochester, NY	231,636	219,773	-5.1%	-4.6%	-4.2%
New Haven, CT	130,474	123,626	-5.3%	-0.7%	3.5%
Albany, NY	101,082	95,658	-5.4%	3.5%	-0.6%

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Table 4: Declining Cities—Cities that Lost More Than 2% (continued)

City	(1) Population, 1990	(2) Population, 2000	(3) Growth rate, 1990–2000	(4) Predicted growth rate, 1990–2000 Brookings City Growth Model	(5) Growth rate, 1980–1990
Cleveland, OH	505,616	478,403	-5.4%	-6.8%	-11.9%
Washington, DC	606,900	572,059	-5.7%	6.4%	-5.0%
Toledo, OH	332,943	313,619	-5.8%	4.1%	-6.1%
Jackson, MS	196,637	184,256	-6.3%	12.0%	-3.1%
Lansing, MI	127,321	119,128	-6.4%	6.4%	-2.4%
Detroit, MI	1,027,974	951,270	-7.5%	-2.6%	-14.6%
Birmingham, AL	265,968	242,820	-8.7%	4.1%	-6.5%
Dayton, OH	182,044	166,179	-8.7%	0.9%	-5.9%
Macon, GA	106,612	97,255	-8.8%	9.3%	-8.8%
Cincinnati, OH	364,040	331,285	-9.0%	2.7%	-5.5%
Pittsburgh, PA	369,879	334,563	-9.6%	-1.4%	-12.8%
Syracuse, NY	163,860	147,306	-10.1%	-2.3%	-3.7%
Norfolk, VA	261,229	234,403	-10.3%	6.7%	-2.2%
Buffalo, NY	328,123	292,648	-10.8%	-5.9%	-8.3%
Flint, MI	140,761	124,943	-11.2%	-3.6%	-11.8%
Baltimore, MD	736,014	651,154	-11.5%	-3.0%	-6.5%
St. Louis, MO	396,685	348,189	-12.2%	1.7%	-12.4%
Hartford, CT	139,739	121,578	-13.0%	-7.6%	2.5%

See note 2 for additional explanation.

A. The median growth rate for cities in the 1990s was 8.7 percent—more than double the median growth rate of the 1980s.

The mean city growth level was mildly positive: 11.2 percent. Despite recent media reports of the growth of the largest cities, this rate is extremely close to the average growth rate of cities in the 1980s (9 percent); they are not statistically different. However, the median growth rate in the 1990s is 7 percent, which is almost double the median growth rate in the 1980s. The difference between mean and median is explained primarily by the fact that the 1980s had more high fliers (which affects the mean but not the median) than the 1990s. If we calculate the average growth rate weighting by population, the 1990s also look better for cities. The growth rate of cities in the 1990s (calculated weighting by 1990 population) is 9.8 percent. The analogous growth rate in the 1980s is 6.2 percent.

The differential impact of population weighting on 1980s and 1990s data reflects modest differences in the relationship between initial city population and mean growth rates in the '80s compared to '90s. In the 1990s, big cities did better (relative to medium-size cities) than in the 1980s. Table 5 gives the mean growth rate for cities in three size categories in the 1980s and 1990s. In general, there is no statistically significant relationship between initial city size and later growth. However, there are interesting differences between the 1980s and the 1990s. Cities with initial population levels between 100,000 and 250,000

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Table 5: City Growth and Initial City Size

Population, 1990	Number of cities, 1990–2000	Growth rate, 1990–2000	Number of cities, 1980–1990	Growth rate, 1980–1990
100,000 – 250,000	131	11.7%	114	10.6%
250,000 – 1,000,000	56	10.5%	50	6.5%
more than 1,000,000	8	7.0%	6	-0.8%
Total	195	11.2%	170	9.0%

grew only slightly faster in the 1990s: 11.7 percent vs. 10.6 percent on average. However, cities with more than one million people grew much faster in the 1990s: 7.0 percent vs. —0.8 percent.

It is tempting for us to see this relative growth of the largest cities as vindication of our earlier work arguing that big cities were not dying.[3] However, it should be stressed that these differences are not statistically significant, because of the stunning variety of growth experiences across cities. The data certainly suggests a continuing resilience of the largest cities, but this suggestion is far from proof of long run success. We shall have to wait for later decades to find out if advances in information technology (and other trends) really mean the end of our densest cities.

There has been a dizzying array of growth rates across cities. Las Vegas (which has generally been the fastest-growing city in the post-war era) grew by 85 percent. St. Louis (one of the reliably declining cities) shrunk by almost 13 percent. While it is tempting to read much into a 9.3 percent increase in population in New York City or a 4 percent increase in Chicago, it is worthwhile to emphasize that more than 25 percent of cities in our sample grew by 18 percent or more. New York and Chicago are among the moderately growing cities—they are not high fliers.

No cities fell by more than 13 percent, but over one-third grew by more than 13 percent. One explanation for this fact is that as long as a city has homes, people will live in them, which puts something of a brake on population loss. Because the change in population is tied to a change in housing, there is a natural asymmetry between population increases (which can always be accommodated by more building) and population decreases (which are unlikely to be too large, because then large numbers of houses would be vacant, which does not really happen). Thus, St. Louis survives because of the extraordinary permanence of its housing stock. While economic opportunities in the city may have dried up, the housing stock remains, and people stay in the city to take advantage of that housing stock.

A final basic fact about city growth, which has been true for many decades,[4] is that there is an extremely strong relationship in city growth across decades. Cities that grew fast in the 1980s grew fast in the 1990s. While there are some exceptions, (Arlington, Virginia, did better in the 1980s than in the 1990s, Las Vegas did better in the 1990s), this is an extremely strong relationship—indeed it is the strongest relationship seen in this survey. This persistence in growth rates helps us to understand that the same factors that explained growth in the 1980s explained growth in the 1990s. Of course, we still don't really understand why growth rates are so correlated over time. This remains one of the important, unsolved puzzles of urban growth.

B. Western cities grew the fastest, followed by Southern cities and Midwestern cities, while Northeastern cities lost population.
Almost one-quarter of the variation in growth rates across cities in the 1990s can be explained by differences in regions. The average growth rate across cities in the West was 19.5 percent. This is close to the average growth rate in the West in the 1980s, which was 23.4 percent. The South is the second fastest-growing region. The average growth rate in the 1990s across cities in the South was 12 percent. The comparable rate in the 1980s was 9 percent. These two regions have been the big success stories of the post-war era and their growth is the tale of the rise of the sunbelt.

The 1990s were much better to Midwestern cities than previous decades have been. Cities in the Midwest grew by an average of 3.4 percent in the 1990s, but they shrunk by 2.5 percent in the 1980s. This difference comes in part from the fact that in the 1990s several Midwestern cities were high fliers. Sioux Falls, South Dakota, grew by 22 percent. Overland Park, Kansas, grew by 33 percent. In the 1980s, Madison, Wisconsin, was the Midwest's fastest growing city, and it expanded by only 12 percent. Weighting by population causes the average growth rate in the Midwest to fall to 2.3 percent, but it also reduces the growth rate of the 1980s. The rise of some Midwestern cities is an interesting feature of urban growth in the 1990s.

In the 1980s, the Midwest was the slowest growing region, but in the 1990s, the East had the slowest growth—often negative growth. In both decades, the average eastern city shrunk by around 1 percent. No Eastern cities are high fliers, and most Eastern cities declined. However, the Eastern cities look a bit better if their growth rates are averaged weighting by 1990 population. In that case, cities grew by 4 percent on average. This reflects the relative success of New York City and Boston.

Why are these regional patterns so strong? One simple explanation is that the growth of the South and West just reflects the importance of the weather. To examine this hypothesis, we first look at the relationship between city growth and average January temperature in the city between 1960 and 1990. Cities with an average daily temperature in January of less than 30 degrees Farenheit grew by less than 5 percent on average, while cities above 50 degrees grew by more than 15 percent on average. (See Figure 1.)

We can perform a similar exercise for average annual rainfall. Cities with less than 15 inches of average annual precipitation grew more than

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20 percent on average, compared to less than 10 percent for cities with over 45 inches.

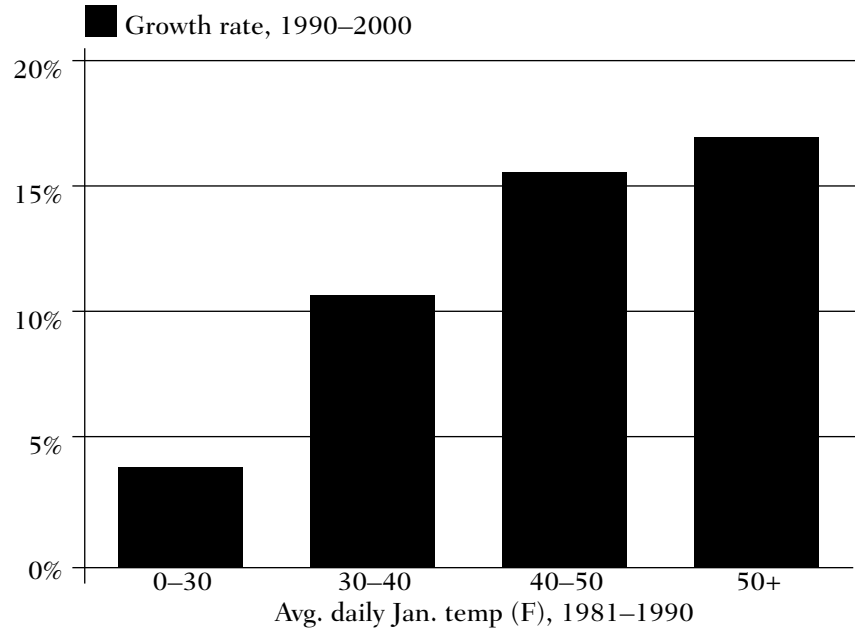
Why is weather so important a determinant of city growth? There are three schools of thought on this issue. The first view is that the spread West and South is the continuation of an almost 400 year process in which European settlers originally came to the cold, wet part of the country, and their descendants and other immigrants have been spreading out ever since. While this view perhaps has some truth, the South did not experience relative population growth for the 80 years between 1860 and 1940, which does not corroborate the steady spreading out hypothesis.

A second view is that technological advances made it easier to live and work in hotter climates. The post-war period has seen the rise of the air conditioner and the elimination of malaria in the South. Both of these advances make warmer climates more palatable. A third view is that location decisions in the past were driven primarily by factors that drove the productivity of firms. The Midwest was very appealing because of its proximity to the Great Lakes, for example. But as transport costs have fallen, businesses can now locate far more freely, and the residential tastes of consumers have become more dominant.[5] We suspect that all three hypotheses have some truth.

C. High human capital cities grew in the 1990s, as did cities with wealthier residents.

Much of the literature on city growth has focused on cities and human capital.[6] A community's human capital has generally been measured by the median level of schooling in the community or the percent of the residents in the community over the age of 25 with college educations. This literature has repeatedly found that the average skill level in a community is a very good predictor of whether that city's population will rise or fall. Skilled communities rise—unskilled communities fall. This has been true in every time period going back to the late 19th century.[7] In fact, the relationship between growth and human capital was stronger between 1970 and 1990 than between 1950 and 1970.[8]

Figure 1: Temperature and City Growth



In the 1990s, the connection between human capital and growth appears to be at least as strong as in earlier decades. From cities with the lowest levels of human capital (less than 15 percent college educated) to cities with the highest levels (more than 25 percent college educated) the average growth rate increases from 7.5 percent to 16 percent.

Income is commonly thought to be another measure of human capital. Cities with median annual household income below $20,000 grew by only 0.3 percent. By comparison, as Figure 2 shows, cities with median annual household income above $30,000 grew by 18.9 percent. Of course, higher incomes will also be associated with robust labor markets, so the attractiveness of these robust labor markets is another reason why high income cities are growing.

The impact of human capital can also be seen in the effect of the poverty rate on urban growth. A 1 percent increase in the poverty rate is associated with a 1 percent reduction in city population growth over the 1990s. This relationship is about the same as the relationship in the 1980s and corresponds well with results from prior research.[9] Cities with high percentages of poor people tend to lose population.

What causes this relationship between measures of human capital and later growth? One interpretation of the income and poverty numbers is that these are just reflecting bad labor market conditions. This is certainly a possibility, but prior research has strongly suggested that high levels of poverty in cities tend to be permanent

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features of those cities, and reflect the city residents' underlying skill distribution more than local labor markets.[10] Alternatively, places with more skilled workers have just gotten more attractive. There are several hypotheses that could explain such a phenomenon. First, skilled workers may be better at generating new ideas and these ideas lead to expanding labor market opportunities. Second, because we learn from our neighbors, being around skilled workers may be valuable and may have become more valuable as we enter into a more skill-intensive era. Finally, less-skilled workers may be associated with more social problems, and these social problems may deter prospective residents. Further investigation of this issue remains important.

D. Cities with a large manufacturing base grew much more slowly than cities dependent on service industries.

Prior research suggests that industry mix is an important determinant of which cities grow and which shrink.[11] In particular, cities that have a large share of their employment in manufacturing will shrink and cities that are concentrated in services, wholesale and retail trade, or finance, insurance and real estate will grow. This decline of manufacturing cities in part reflects the general decline of manufacturing in the U.S. But this general decline is accompanied by the massive de-urbanization of manufacturing in America.[12] Manufacturing was once centered in American cities. Now it is found in lower density, less expensive areas.

This basic pattern has held up for the 1990s (see Figure 3). Cities that had more than 20 percent of their labor force in manufacturing grew quite slowly over the 1990s. The average rate of growth for these places was 6.3 percent (5.5 percent if the average is weighted by city population). Cities with moderate levels of manufacturing—between 10 and 20 percent of the labor force—grew at an average 12.3 percent rate (10.2 percent if the average is weighted by city population). The growth rate of cities with very little manufacturing, less than 10 percent of the workforce, was 13.3 percent (11.9 percent if the average is weighted by city population). The 7 percent growth rate gap between cities with significant manufacturing and cities with little manufacturing reflects the consistent movement of people away from the manufacturing centers towards places that specialize in trade and services. This effect is primarily a regional shift representing the move away from the rustbelt.

It is worth emphasizing that the connection between manufacturing and city growth has gotten much weaker over the post-war period. In the 1980s and 1990s, manufacturing does predict growth, but the impact is not all that strong and it primarily reflects the regional movements in the country. In the 1950s and 1960s, manufacturing share strongly predicted urban decline and in fact was one of the most important predictors of decline.[13] In general, industry mix has become somewhat less important as a predictor of city growth.

The one exception to this statement is the odd relationship between employment in the health industry (as of 1990) and population growth over the 1990s. This connection is quite strong—cities with the highest percentage of health services employment grew over 20 percentage points less quickly than cities with the least health services employment.

Notably, this relationship does not come about because cities with bigger health sectors have older residents, and therefore have less growth. While it is true that there is a slight connection between employment in the health sector and the median age of the community, there is only a very weak connection between the median age of the community and later community growth. The gap in growth rates between cities with the oldest

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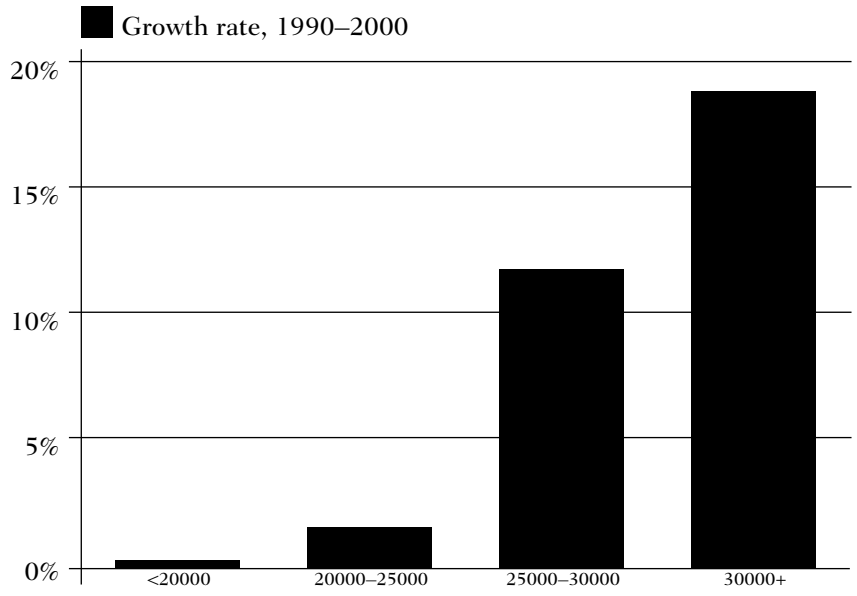
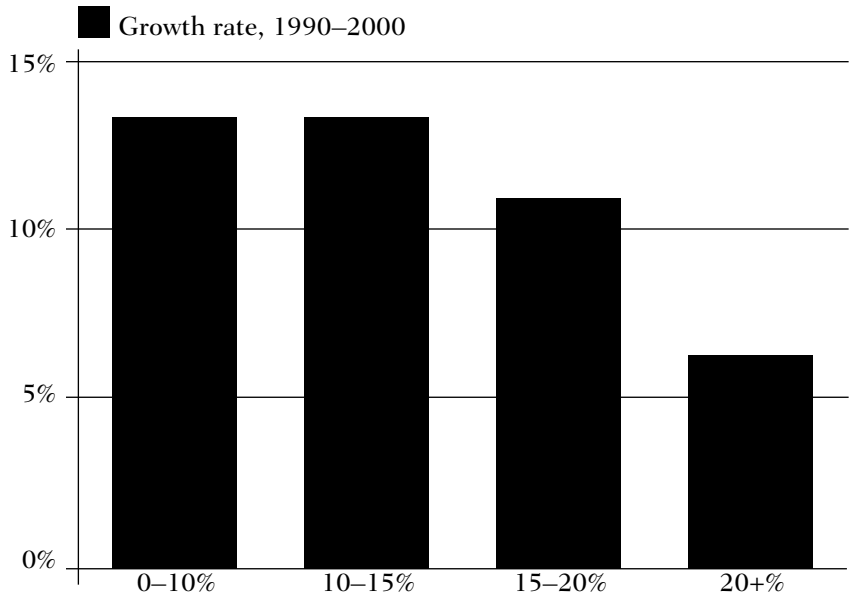
Figure 2: Income and City Growth



and youngest residents is less than 4 percent. The idea that community age drives city growth is really not true. Our explanation for this connection is that the health industry is concentrated primarily in poorer places and that, as discussed above, population has drained away from low human capital areas.

A final unsurprising employment fact is the connection between city unemployment rates and city growth. The average growth rate over the 1990s for cities with unemployment rates above 10 percent in 1990 was less than 3 percent. The average growth rate for cities with unemployment rates below 5 percent was 21 percent. Part of this connection reflects the fact that unemployment is connected to the human capital level of the area and part of it reflects the general appeal of areas with robust labor markets.[14]

Figure 3: Manufacturing Employment and City Growth



E. Cities built for cars grew, but cities designed for mass transit and pedestrians tended to shrink.
As incomes have risen and as automobile technology has improved, cars have become an increasingly important element in American life, and in American cities. Within metropolitan areas, the flight to the suburbs reflects, among other things, a movement towards auto-dependency and away from mass transit, with people moving first and employment following.

There is a similar shift that can be seen in the movement of people between cities. Driving cities have grown. Public transportation cities have not (see Figure 4). Cities with less than 65 percent of their commuters driving alone grew by less than 2 percent on average, while other cities grew by an average of more than 12 percent. This is not merely another example of regional growth—this fact survives controlling for regions, as a comparison between non-driving cities (such as San Francisco) and driving cities (such as Los Angeles) within the West emphasizes.

Naturally, this connection can also be seen in the decline of public transport-oriented cities. Cities with substantial public transportation systems lost population over the 1990s. The average growth rate for those cites in which more than 10 percent of commuters took public transportation to work in 1990 was nearly zero. The average growth rate for those cities in which less than 3 percent of commuters used public transportation in 1990 was almost 17 percent. There has been a huge shift from the older walking and public transport-oriented cities of the past to the driving cities of today. Of course, New York and Chicago were somewhat exceptional over the 1990s, as they actually grew, but they were balanced by shrinking cities like Pittsburgh and Philadelphia.

It may be that the rise of driving cities represents an even broader phenomenon of an urban life cycle. It is possible that in every age new technologies have come along that have made some of the features of older cities somewhat obsolete. As a result, people have moved to newer cities built around different technologies. In the case of the American cities in the 1990s, urban age, as determined by housing stock, is one of the most powerful determinants of city growth. The average growth rate for those cities in which less than 10 percent of the housing stock was constructed before 1939 is nearly 20 percent. The average growth rate for cities in which between 10 and 40 percent of the building stock existed before 1939 is 5.9 percent. The average growth rate for cities in which more than 40 percent of the building stock is more than 62 years old was –1.2 percent.

Of course, much of the effect of housing stock age comes about because cities which are not growing will tend to have few new houses (almost definitionally). As a result, it is useful to check whether this city age result withstands controlling for the previous decade's growth rate. We find

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that the impact of the age of the building stock gets much weaker, but it still remains quite significant. It appears to be true that newer cities are replacing older cities—in part because they are oriented to cars, not public transportation and walking.

F. Immigrants contributed to city growth.

The relationship between city growth and share of the population that is foreign born has not been examined in the previous literature, but given the large wave of immigrants into the U.S. over the 1990s, it is important to ask whether cities that attract immigrants have grown faster than those that do not. Figure 5 compares average growth rates for four classes of cities: cities with less than 3 percent foreign-born residents as of 1990, cities with between 3 and 8 percent foreign-born residents in 1990, cities with between 8 and 15 percent foreign-born residents in 1990, and cities with more than 15 percent foreign-born residents in 1990. The growth rates for the three classes are 5.3 percent, 10.9 percent and 17.5 percent, and 12.1 percent, respectively. When these averages are found by weighting city population, they are 4.8 percent, 7.5 percent, 19.5 percent, and 9.7 percent, respectively.

The basic pattern is one in which cities with more foreign-born residents, as of 1990, grew more quickly than cities with fewer foreign-born residents. However, the cities with the highest percentages of foreign-born residents did not grow the most.

What explains the connection between attracting immigrants and later growth? It is possible that the presence of immigrants increases growth rates because as the census has improved its counting, immigrant communities have been better measured. According to this view the connection between growth and

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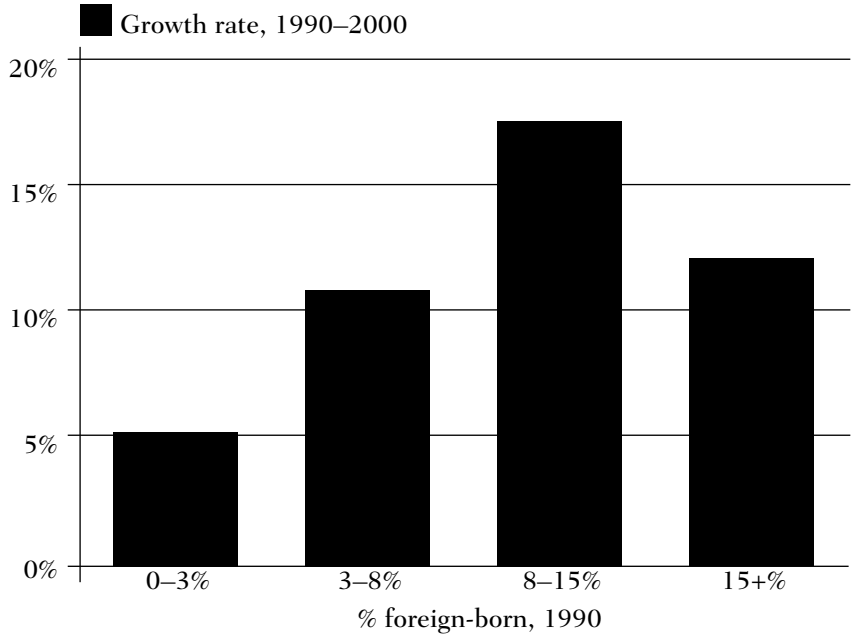
Figure 4: Commuting By Car and City Growth

Figure 5: Immigrants and City Growth



immigrant population is an artificial feature of the data. A second hypothesis is that growing cities just attract more foreign-born people, just as they attract other domestic migrants. Finally, the presence of immigrant communities in 1990 may have made the area more attractive to newer immigrants. As the 1990s had high levels of immigration, the cities that attracted those immigrants grew more quickly. Further investigation of this effect is an important topic for further research.

III. Conclusion

Cities in the 1990s have displayed remarkable diversity. A full quarter of cities with more than 100,000 people in 1990 have grown by more than 16 percent over the decade. A full quarter of these cities also declined. There is a massive amount of heterogeneity between Las Vegas with its 85 percent growth rate and St. Louis with its 13 percent decline.

But within this diversity, certain patterns seem clear, and these patterns force us to recognize the similarities between the 1990s and previous decades. First, the basic regional patterns—the West grew most, the South grew significantly and the Northeast and the Midwest stagnated— remained. Second, these regional patterns can be understood as the result of the tyranny of the weather. Warm, dry places grew. Cold, wet places declined. This has been true throughout the post-war period.

Beyond the weather, the most important factor driving the success of a city is its human capital base. Cities with skilled workers or high median incomes grew, and cities with high levels of poverty shrank. This suggests that city leaders who want to encourage growth need to think about whether their policies are encouraging skilled workers to live there.

Industry mix still matters. Manufacturing cities are still doing badly, but this seems to be less important than it once was. This leads us to be skeptical about the idea that mayors will revitalize their cities by luring big manufacturing plants. Surprisingly, cities with big health industries did particularly badly over the 1990s. It is difficult to understand this phenomenon.

Cities built to accommodate lots of cars and lots of driving gained residents; cities built for public transportation generally did not. This could reflect a larger trend of older cities losing population and newer cities gaining them. The age of the city's population does not impact city growth, but the age of the building stock does, and the old cities did quite poorly over the 1990s. This generally captures the remarkable transformation of the American city as it moves from the walking-based city of the 19th century to the car-based environment of the present and future.

Finally, immigrant cities did relatively well. This was particularly true of those cities with moderate immigrant populations. The high immigrant cities were actually less successful than those cities with populations that were between 5 and 15 percent foreign born.

Overall, the pattern of city growth in the 1990s shows remarkable continuity with previous decades. While it is true that growth among the largest cities has been higher than in previous decades, the overall patterns look quite similar. The same factors which explained city growth in the 1980s predicted city growth between 1990 and 2000. While economists may have trouble predicting long run movements in GDP, we can do a little better predicting changes in city populations.

Endnotes:

1 Our comparison data set for the 1980s also consists only of cities with a population greater than 100,000 in 1980. We are here specifically focusing on cities, not metropolitan areas. This is in part to make our work more compatible with previous literature, but we also think that the somewhat smaller size of cities makes them better than metropolitan areas for some forms of urban analysis.

2 The Brookings City Growth Model predicts the growth rate of city i using the following formula:
$Growth_i = -63.85 - 0.3023*Rain_i + 0.7397*Temp_i + 18.09*Cars_i + 0.2309*Educ_i - 0.2945*Manuf_i$
where "$Growth_i$" refers to the percent growth rate of city *i* and is calculated as follows:
$Growth_i = 100*$(Population in 2000 of city *i* – Population in 1990 of city *i*)/(Population in 1990 of city *i*)
and where "$Rain_i$" refers to average annual precipitation in city *i* measured in inches, "$Temp_i$" refers to mean July temperature in city *i* measured in degrees Fahrenheit, "$Cars_i$" refers to average number of vehicles per household in city i in 1990, "$Educ_i$" refers to the percent of persons 25 years and older in city *i* in 1990 with college degree or higher, and "$Manuf_i$" refers to the percent of civilians in city *i* in 1990 employed in manufacturing.

This formula was obtained using multiple regression and all coefficients are statistically significant. This model is able to explain 43.46 percent of the overall variation in growth rates in our sample of 195 cities with populations greater than 100,000 in 1990.

3 See Glaeser, E.(1998) "Are Cities Dying?" *Journal of Economic Perspectives,* 12:139–160, and Gaspar, J. and E. Glaeser, (1998) "Information Technology and the Future of Cities," *Journal of Urban Economics,* 43: 136–156.

4 See Glaeser E., J.A. Scheinkman, and A. Shleifer, (1995) "Economic Growth in a Cross-Section of Cities." *Journal of Monetary Economics,* 36: 117–143.

5` Glaeser, E. J. Kolko, and A. Saiz, (2001) "Consumer city," Journal of Economic Geography, forthcoming.

6 Glaeser, E. (1994), "Cities, Information, and Economic Growth," Cityscape 1(1): 9–47. Glaeser et al. (1995). Simon C. J. and C. Nardinelli, (1996) "The Talk of the Town: Human Capital, Information, and the Growth of English Cities, 1861–1961." *Explorations in Economic History.* 33 (3): 384–413.

7 Simon and Nardinelli (1996)

8 Glaeser et al. (1995)

9 Glaeser et al. (1995)

10 Glaeser (1994)

11 Glaeser et al. (1995)

12 See Glaeser (1998)

13 Glaeser et al. (1995)

14 See Blanchard, O. J. and L. Katz (1992) "Regional Evolutions." Brookings Papers on Economic Activity. 1:1992: 1–61, for evidence on migration.

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